PCT



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant or expert's fill reference 15836 MdH International application No. PCTXBR2005x000645 International part of the international filling date (day/month/year) 03.03.2005 International Palant Classification (IPC) or national classification and IPC INV. C25D11/26 A61F2/30 A61L27/34 A61L27/36 A61L27/30 A61L27/32 A61L27/34 A61L27/36 Applicant Applican						
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No. PCT/GB2005/000645

	Box No. I B	asis of the report
1.	With regard to	the language , this report is based on
	⊠ the interna	ational application in the language in which it was filed
١		ion of the international application into , which is the language lation furnished for the purposes of:
	☐ publica	ational search (under Rules 12.3(a) and 23.1(b)) ation of the international application (under Rule 12.4(a)) ational preliminary examination (under Rules 55.2(a) and/or 55.3(a))
1	have been furi	the elements * of the international application, this report is based on (replacement sheets whic nished to the receiving Office in response to an invitation under Article 14 are referred to in this sinally filed" and are not annexed to this report):
ļ	Description, Pa	ages
	1-9	as originally filed
. (Claims, Numbe	ers
1	6	as originally filed
•	1-5	received on 23.12.2005 with letter of 21.12.2005
I	Drawings, She	ets
•	1/1	as originally filed
[□ a sequend	ce listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. [☐ The amen	dments have resulted in the cancellation of:
		scription, pages
		ims, Nos. awings, sheets <i>l</i> figs
·	\square the sec	quence listing <i>(specify)</i> :
	☐ any tat	ole(s) related to sequence listing <i>(specify)</i> :
4. [nad not been r	t has been established as if (some of) the amendments annexed to this report and listed below made, since they have been considered to go beyond the disclosure as filed, as indicated in the Box (Rule 70.2(c)).
		scription, pages ims, Nos. 1-5
	\square the dra	wings, sheets/figs
•		quence listing <i>(specify)</i> : ble(s) related to sequence listing <i>(specify)</i> :
		4 applies, some or all of these sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No. PCT/GB2005/000645

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims

1-6

No: Claims

Inventive step (IS)

Yes: Claims

1-6

No: Claims

Industrial applicability (IA)

Yes: Claims

1-6

No: Claims

2. Citations and explanations (Rule 70.7):

see separate sheet

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (SEPARATE SHEET)

International application No.

PCT/GB2005/000645

Re Item I

The amendments filed with letter dated 21.12.05 introduce subject-matter which extends beyond the content of the application as originally filed, contrary to Article 34(2)(b)PCT. The amendments concerned are the following: "the current density is sufficiently low, the electrolyte concentration sufficiently high".

Re Item V

The documents cited in the International Search Report (ISR) are consecutively numbered D1 to D2 in the order of their listing. If not indicated otherwise, reference is made to the passages cited in said ISR.

None of the presently available prior art documents disclose the presently claimed subject matter. Thus, the subject matter of Claims 1 to 6 is new (Article 33(2) PCT). The closest prior art in respect of Claim 1 to 6 appears to be document D1 since this document discloses a method of treating a titanium implant by anodising and then performing anion exchange in order to incorporate biocidal metal ions into the surface.

The difference between the method of D1 and the presently claimed method is the present use of a higher voltage in combination with suitable anodisation conditions. Thus, the objective technical problem to be solved is to confer biocidal / hardwearing properties on titanium implants while at the same time retaining the surface properties of the implant surface.

The solution proposed by claim 1 is to control the number and size of the shallow pits by controlling the conditions of the anodisation as described in claim 1. Even though anodising methods for treating titanium metal implants are known in the art (D1), there is no indication or teaching in document D1 that the particular combination of voltage and duration of treatment disclosed therein would produce the technical effects noted above in contrast to the methods of D1 as shown in Figure 1. Thus the presently claimed subject cannot be obviously derived from the teaching of document D1 and appears to make an inventive contribution to the present art. Thus, the subject matter of Claim 1 to 6 is inventive (Article 33(3) PCT).

- 10 -

Claims

- A method of treating a titanium metal implant for use in a surgical procedure, so as to form a surface layer that is integral with the metal substrate and which incorporates a biocidal material, by anodising the implant to form a surface layer and then performing ion exchange so as to incorporate ions of a biocidal metal into the surface layer, characterised in that the method comprises anodising the implant at a voltage above 50 V 10 for a period of at least 30 minutes, so as to generate the surface layer, wherein the current density is sufficiently low, the electrolyte concentration sufficiently high, and the duration of anodising and the magnitude of the anodising voltage are such that the 15 anodising generates a dense hard surface layer and also shallow pits in the surface layer which are filled with a somewhat softer and more porous material.
- 20 2. A method as claimed in claim 1 wherein the biocidal metal is silver.
- 3. A method as claimed in claim 1 or claim 2 wherein the anodising step uses an electrolyte comprising phosphoric acid.
 - 4. A method as claimed in claim 3 wherein the phosphoric acid is of concentration between 5% and 20% by weight.

5. A method as claimed in claim 3 or claim 4 wherein the electrolyte comprises chloride irons at a concentration no more than 500 ppm.